

COMPLETE LISTING OF CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1 – 21 (Canceled)

22. (currently amended) An apparatus for forming a compressed composite material which comprises carbon fibers, the apparatus comprising:

a vessel which defines a cavity for receiving composite material to be treated, wherein the composite material comprises carbon fibers;

a means for applying pressure which applies a pressure of at least 35 kg/cm² to the material in the cavity;

a source of electric current which applies a current to the material, the current flowing through the material to resistively heat the material;

a displacement detector which detects linear displacement of the means for applying pressure;

a temperature detector which detects the temperature of the material; and

a control system which controls the pressure applying means and source of electrical current such that the mixture is sequentially heated at a first temperature and pressed at a first pressure for a first period of time, and heated at a second temperature higher than the first temperature and at a second pressure higher than the first pressure for a second period of time.

23. (Canceled)

24. (previously presented) The apparatus of claim 22, wherein the means for applying pressure comprises a first piston positioned to engage the material within the vessel.

25. (previously presented) The apparatus of claim 24, wherein the means for applying pressure comprises a second piston positioned opposite the first piston.

26. (previously presented) The apparatus of claim 22, wherein the source of electric current operative engages the material through the means for applying pressure.

27. (previously presented) The apparatus of claim 22, further comprising insulation positioned around the vessel.

28. (previously presented) The apparatus of claim 22, further comprising a pressure sensor operatively attached to the pressure applying means and the control system to indicate the presence of the first pressure and the second pressure within the vessel.

29. (previously presented) The apparatus of claim 28, wherein the pressure sensor is a displacement sensor relaying the displacement of the pressure applying means to the control system.

30. (currently amended) An apparatus for forming a compressed composite material which comprises carbon fibers, the apparatus comprising:

a holding area shaped to receive the material, wherein the material comprises carbon fibers;

a first pressure element positioned to engage the material to apply pressure to the material in a first direction;

a displacement detector for detecting linear displacement of the first pressure element; and

a source of electric current operatively engaging the first pressure element to apply a current to the material through the first pressure element to resistively heat the material.

31. (previously presented) The apparatus of claim 30, further including a second pressure element positioned to engage the material to apply pressure to the material in a second direction.

32. (previously presented) The apparatus of claim 31, wherein the first pressure element is positioned opposite the second pressure element.

33. (previously presented) The apparatus of claim 31, wherein the source of electric current operatively engages the second pressure element to apply a current to the material through the second pressure element to resistively heat the material.

34. (previously presented) The apparatus of claim 30, further comprising a control system operatively connected to the holding area, the first pressure element, and the source of electric current to regulate the pressure and the electrical current in the material.

35. (previously presented) The apparatus of claim 34, wherein the control system controls the source of electric current and the first pressure element to sequentially heat the material at a first temperature and press the material to a first pressure for a first period of time and heat the material at a second temperature higher than the first temperature and press the material at a second pressure higher than the first pressure for a second period of time.

36. (previously presented) The apparatus of claim 34, further comprising a temperature monitoring device operatively connected to the material and the control system to relay the temperature of the material to the control system.

37. (previously presented) The apparatus of claim 34, further comprising a pressure monitoring device operatively connected to the material and the control system to relay the pressure of the material to the control system.

38. (previously presented) The apparatus of claim 30, wherein the holding area includes sides and each side is substantially shaped as a parallelogram.

39. (currently amended) An apparatus for forming a compressed composite material which comprises carbon fibers, the apparatus comprising:

a holding area shaped to receive the material, wherein the material comprises carbon fibers;

a first pressure element positioned to engage the material to apply pressure to the material in a first direction;

a second pressure element positioned opposite the first pressure element to engage the material to apply pressure to the material in a second direction;

a displacement detector for detecting linear displacement of the first pressure element and the second pressure element;

a source of electric current operatively engaging the first and second pressure elements to apply a current to the material through the first and second pressure elements to heat the material; and

a control system operatively connected to the first pressure element, the second pressure element, and the source of electric current to regulate the pressure and electrical current in the material.

40. (previously presented) The apparatus of claim 39, wherein the control system controls the source of electric current and the first and second pressure elements to sequentially heat the material at a first temperature and press the material to a first pressure for a first period of time and heat the material at a second temperature higher than the first temperature and press the material at a second pressure higher than the first pressure for a second period of time.

41. (previously presented) The apparatus of claim 40, further comprising:
a temperature monitoring device operatively connected to the material and the control system to relay the temperature of the material to the control system; and
a pressure monitoring device operatively connected to the material and the control system to relay the pressure of the material to the control system.

42. (previously presented) The apparatus of claim 41, further including insulation positioned around the holding area.